What is claimed is:

1. A projection zoom lens system that projects, onto a screen, projection light from a light modulator, which includes a plurality of elements and forms an image by changing directions of reflection of illuminating light from an illuminating optical system using the plurality of elements,

the projection zoom lens system including first, second, third, fourth, and fifth lens groups arranged in this order from the screen side,

the fifth lens group being a common lens group that is disposed on the front side of the light modulator, transmits the illuminating light and the projection light, and does not move during zooming,

the first lens group being a focusing lens group that moves in order to adjust a focus and does not move during zooming,

the third lens group being a zooming lens group and zooming effect is mainly produced by movement of this group, and

the second and fourth lens groups being compensating lens groups that mainly compensate aberrations by moving when zooming is carried out.

2. A projection zoom lens system according to Claim 1,

wherein the first lens group has a negative refractive power, the second lens group has a positive refractive power, the third lens group has a positive refractive power, the fourth lens group has a negative refractive power, and the fifth lens group has a positive refractive power.

3. A projection zoom lens system according to Claim 1,

wherein at least one of the first, second, and fourth lens groups includes an aspherical lens.

4. A projection zoom lens system according to Claim 3,

wherein the first and fourth lens groups include an aspherical lens.

5. A projection zoom lens system according to Claim 2,

wherein the second, third and fourth lens groups move towards the screen when zooming is carried out from a wide-angle end to a telephoto end.

6. A projection zoom lens system according to Claim 2,

wherein the third lens group includes, sequentially from the screen side, a positive lens that is convex on the screen side, a double-concave negative lens, and a positive lens that is convex on the light modulator side.

7. A projection zoom lens system according to Claim 6,

wherein a focal length fw of the projection zoom lens system at the wide-angle end and a focal length f3 of the third lens group satisfy the following condition

$$1.4 < f3/fw < 2.1.$$

8. A projection zoom lens system according to Claim 2,

wherein a focal length fw of the projection zoom lens system at the wide-angle end, a focal length ft of the projection zoom lens system at the telephoto end, and a distance T4 of the fourth lens group traveling during zooming satisfy the following condition

$$4.75 < T4 \times ft/fw < 6.6.$$

9. A projector comprising a projection zoom lens system according to Claim 1, the light modulator, and the illumination optical system.